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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/596,349

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Stefano Oggioni

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INTERNATIONAL BUSINESS MACHINES CORPORATION

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HOPEWELL JUNCTION, NY 12533

EXAMINER

SAAD, ERIN BARRY

ART UNIT

PAPER NUMBER

1793

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/596,349	Applicant(s) OGGIONI ET AL.	
	Examiner ERIN B. SAAD	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 October 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 7-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 7-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2, 7, 10-13 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Desai et al. (5,170,931) in view of Ehrichs et al. (6,593,168).

Regarding claims 1, 10 and 11, Desai et al. discloses a method for mounting/aligning a flexible film semiconductor chip on a substrate. Desai et al. discloses at least three pads 11,12 that are aligned forming more than three pairs. There are copper (electrically conductive) solder balls disposed between the pads (column 2 line 46- column 3 line 4 and figures 1a-1b). Desai et al. discloses that the solder pads may be rectangular (column 8 lines 61-64) and when the solder pads are rectangular as disclosed by Desai et al., the angle formed by the long edge of the solder pads would be 90 degrees.

Desai does disclose wetting the pads of the second part with glue/solder, Desai does not disclose that the wetting causes self-alignment. However, Ehrichs does disclose a method for mounting integrated circuits where the solder/glue self-aligns on the pads (column 7 lines 54-63). To one skilled in the art at the time of the invention it would have been obvious to wet the pads with the solder/glue where the wetting causes

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self-alignment of the pairs because Ehrichs discloses that the surface tension of the solder/glue and the pads naturally causes the pads to self-align (column 7 lines 54-63).

While Ehrichs does not specifically disclose that the self-alignment includes an alignment in approximately orthogonal directions in a plane parallel to a surface of the first part and a rotational alignment in the plane, it is inherent that the self alignment would include alignment in approximately orthogonal directions in a plane parallel to a surface of the first part and a rotational alignment in the plane due to the surface tension. As can be seen in figure 4 of Ehrichs, the pads and solder/glue are aligned.

Desai et al. does not specifically disclose that at least one of the pairs of pads are annular shaped pads. However, Desai et al. does disclose that the bonding pads 11 may have virtually any desired size, and/or configuration, such as round, oblong, square rectangular, etc. To one skilled in the art at the time of the invention it would have been obvious to use pads of desired shapes and sizes because Desai et al. states that it depends on the intended use of the application such as compatibility with the process of manufacturing and spacers (column 8 line 61- column 9 line 10).

Regarding claims 2, 15 and 16, Desai et al. discloses heating and melting the solder and then solidifying the solder at a cooler temperature (room temperature) (column 2 line 65 to column 3 line 4).

Regarding claim 7, Desai et al. discloses that the corresponding bonding pads are matching (column 2 lines 46-51).

Regarding claims 12-13, Desai et al. does not disclose the volume of the glue being used to bond the two parts together. However, it would have been obvious at the

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time of the invention to one of ordinary skill in the art to use a predetermined volume of glue (solder balls) to ensure a desired bond of the two parts without causing the solder to flow off the pads during heating.

3. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Desai et al. (5,170,931) and Ehrichs et al. (6,593,168) as applied to claim 1 above, and further in view of Hauer et al. (6,125,043).

Regarding claim 8, Desai et al. does not disclose a passive spacer. However, Hauer et al. does disclose a passive stopper/stand-offs 20 for accurately positioning components on a circuit board. It would have been obvious at the time of the invention to one of ordinary skill in the art to have stoppers because Hauer et al. states that the spacers/standoffs 20 determine the vertical position of the components (column 4 lines 31-64 and figure 3).

Regarding claim 9, Desai et al. and Hauer et al. do not disclose three non-colinear passive spacers. However, it would have been obvious at the time of the invention to one of ordinary skill in the art to have a desired amount of spacers on the part during bonding to create an even vertical position based on the locations of the solder balls/glue because of the pulling force created by shrinkage during cooling of the solder (Hauer et al., column 4 lines 50-53).

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4. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Desai et al. (5,170,931) and Ehrichs et al. (6,593,168) as applied to claim 1 above, and further in view of Nishikawa et al. (PCT/JP01/05050 with translation from US 2003/0092326).

Regarding claim 14, Desai et al. does not disclose applying a mechanical force on the first and second parts where the force is orthogonal to the pads. However, Nishikawa et al. does disclose thermocompression bonding of electronic components with pads 2,4 and solder 2 (figure 1c). It would have been obvious at the time of the invention to one of ordinary skill in the art to use thermocompression bonding to apply a force that is orthogonal to the pads because Nishikawa et al. states that the compression keeps the circuit formation article in mutual electrical contact during bonding (paragraph 0009).

Response to Arguments

5. Applicant's arguments with respect to claims 1-2, 7-16 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ERIN B. SAAD whose telephone number is (571)270-3634. The examiner can normally be reached on Monday through Thursday from 8am-5pm Eastern time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on (571) 272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/E. B. S./
Examiner, Art Unit 1793
12/1/2008

/Kiley Stoner/
Primary Examiner, Art Unit 1793